



09/483881

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Kie Y. Ahn et al.

Examiner: Lee, Kyoung

Patent No.: 7,211,512

Group Art Unit: 2812

Issue Date: May 1, 2007

Docket No: 303.672US1

Title: SELECTIVE ELECTROLESS-PLATED COPPER METALLIZATION

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

ATTN: CERTIFICATE OF CORRECTION BRANCH

**Certificate**

JUN 13 2007

**of Correction**

We are transmitting herewith the attached:

- ☒ Request for Certificate of Correction.
- ☒ Certificate of Correction Form - PTO-1050 (in duplicate)
- ☒ Authorization to charge Deposit Account 19-0743 in the amount of \$100.00 to cover the Certificate of Correction fee.
- ☒ A return postcard.

**Please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.**

SCHWEGMAN, LUNDBERG, WOESSNER & KLUTH, P.A.

Customer No: 21186

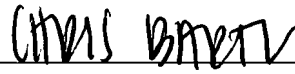
By: 

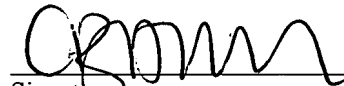
Name: Timothy B. Clise

Reg. No. 40,957

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CERTIFICATE UNDER 37 CFR 1.8: The undersigned hereby certifies that this correspondence is being deposited with the United States Postal Service with sufficient postage as first class mail, in an envelope addressed to: Commissioner of Patents and Trademarks, P.O. Box 1450, Alexandria VA 22313-1450, on this 7 day of June 2007.

  
Name

  
Signature

JUN 13 2007



Patent 7,211,512

PATENT

**IN UNITED STATES PATENT AND TRADEMARK OFFICE**

Patent No.: 7,211,512

Docket No: 303.672US1

Issue Date: May 1, 2007

Patentee: Kie Y. Ahn et al.

Customer No.: 21186

Confirmation No.: 8976

Title SELECTIVE ELECTROLESS-PLATED COPPER METALLIZATION

**REQUEST FOR CERTIFICATE OF CORRECTION**

Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450  
ATTN: CERTIFICATE OF CORRECTION BRANCH

It is requested that a Certificate of Correction be issued correcting printing errors appearing in the above-identified United States patent. Two copies of the text of the Certificate in the suggested form are enclosed.

**Pursuant to 1.20(a), The Commissioner is authorized to charge Deposit Account No. 19-0743 in the amount of \$100.00.**

Issuance of the Certificate of Correction would neither expand nor contract the scope of the claims as properly allowed, and re-examination is not required.

The Examiner is authorized to charge any additional fees or credit overpayment to Deposit Account No.19-0743.

Respectfully Submitted

KIE Y. AHN ET AL.

06/11/2007 HDEMSS2 00000026 190743 7211512

01 FC:1811 100.00 DA

By their Representatives,

SCHWEGMAN, LUNDBERG, WOESSNER & KLUTH, P.A.  
P.O. Box 2938  
Minneapolis, MN 55402  
(612) 373-6900

Date:

7 June '07

By:

Timothy B. Clise  
Reg. No: 40,957  
TBC/cmb

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Name

Chris Batten

Signature

Chris Batten

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## UNITED STATES PATENT AND TRADEMARK OFFICE CERTIFICATE OF CORRECTION

PATENT NO : 7,211,512

Page (1) of 20

DATED : May 1, 2007

INVENTOR(S) : Ahn et al.

It is certified that errors appear in the above-identified patent and that said Letters Patent  
is hereby corrected as shown below:

On the face page, in field (56), under "U.S. Patent Documents", in column 1, line 1, above  
"2,842,438 A 7/1958 Saarivirta et al. 75/153" insert

-- 1,254,987	1/1918	Cooper	
1,976,375	10/1934	Smith, J. K.	148/11.5
2,244,608	6/1941	Cooper, H. S.	75/138 --.

On the face page, in field (56), under "U.S. Patent Documents", in column 1, line 2, below  
"2,842,438 A 7/1958 Saarivirta et al. 75/153" insert

-- 3,147,110	9/1964	Foerster	75/122.5
3,337,334	8/1967	Fenn et al.	75/150
3,506,438	4/1970	Krock et al.	75/208
3,548,915	10/1970	Richmond et al.	164/68
3,548,948	12/1970	Richmond et al.	164/68
3,687,737	8/1972	Krock et al.	148/2
3,832,456	8/1974	Kobetz et al.	423/645
3,932,226	1/1976	Klatskin et al.	204/16
3,954,570	6/1976	Shirk et al.	204/15
4,022,931	5/1977	Black et al.	427/91
4,029,377	6/1977	Guglielmi	339/19
4,065,330	12/1977	Masumoto et al.	148/31.55
4,101,855	7/1978	Drapeau	335/106
4,158,719	6/1979	Frantz	428/567
4,213,818	* 7/1980	Lemons et al.	438/719
4,233,066	11/1980	Sundin et al.	75/142
4,314,594	2/1982	Pfeifer et al.	148/108
4,386,116	5/1983	Nair et al.	427/99
4,389,429	6/1983	Soclof	438/492
4,423,547	1/1984	Farrar et al.	29/571
4,561,173	12/1985	Te Velde	438/619 --.

MAILING ADDRESS OF SENDER:

SCHWEGMAN, LUNDBERG, WOESSNER, & KLUTH, P.A.  
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Minneapolis, MN 55402

Atty Docket No: 303.672US1

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## UNITED STATES PATENT AND TRADEMARK OFFICE CERTIFICATE OF CORRECTION

PATENT NO : 7,211,512

Page (2) of 20

DATED : May 1, 2007

INVENTOR(S) : Ahn et al.

It is certified that errors appear in the above-identified patent and that said Letters Patent  
is hereby corrected as shown below:

On the face page, in field (56), under "U.S. Patent Documents", in column 1, line 4, below  
"4,565,157 A 1/1986 Brors et al." insert

-- 4,574,095 3/1986 Blaum et al. 427/53.1  
4,670,297 6/1987 Lee et al. 427/91  
4,709,359 11/1987 Loftin 367/155 --.

On the face page, in field (56), under "U.S. Patent Documents", in column 1, line 5, below  
"4,762,728 A 8/1988 Keyser et al. 427/38" insert

-- 4,788,082 11/1988 Schmitt 427/248.1  
4,824,544 4/1989 Mikalesen et al. --.

On the face page, in field (56), under "U.S. Patent Documents", in column 1, line 6, below  
"4,847,111 A 7/1989 Chow et al. 427/38" insert

-- 4,857,481 8/1989 Tam et al. 437/182  
4,931,410 6/1990 Tokunaga et al. 437/189  
4,933,743 6/1990 Thomas et al. --.

On the face page, in field (56), under "U.S. Patent Documents", in column 1, line 8, below  
"4,962,058 A 10/1990 Cronin et al. 437/187" insert

-- 4,996,584 2/1991 Young et al. 357/71  
5,019,531 5/1991 Awaya et al. 437/180 --.

On the face page, in field (56), under "U.S. Patent Documents", in column 1, line 10, below  
"5,043,299 A 8/1991 Chang et al." insert

-- 5,045,635 9/1991 Kaplo et al. 174/35 GC  
5,071,518 12/1991 Pan --.

On the face page, in field (56), under "U.S. Patent Documents", in column 1, line 11, below  
"5,084,412 A 1/1992 Nakasaki 437/189" insert

-- 5,100,499 3/1992 Douglas 156/635 --.

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PATENT NO : 7,211,512

Page (3) of 20

DATED : May 1, 2007

INVENTOR(S) : Ahn et al.

It is certified that errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

On the face page, in field (56), under "U.S. Patent Documents", in column 1, line 12, below "5,130,274 A 7/1992 Harper et al. 437/195" insert

-- 5,148,260 9/1992 Inoue et al. 357/67

5,149,615 9/1992 Chakravorty et al. 430/313 --.

On the face page, in field (56), under "U.S. Patent Documents", in column 1, line 15, below "5,180,687 A 1/1993 Mikoshiba et al." insert

-- 5,227,658 7/1993 Beyer et al. 257/522

5,231,036 7/1993 Miyauchi et al. --.

On the face page, in field (56), under "U.S. Patent Documents", in column 1, line 16, below "5,231,056 A 7/1993 Sandhu 437/200" insert

-- 5,232,866 8/1993 Beyer et al. 437/62

5,240,878 8/1993 Fitzsimmons et al. 437/187

5,243,222 9/1993 Harper et al. 257/774

5,256,205 10/1993 Schmitt III et al. 118/723

5,268,315 12/1993 Prasad et al. 437/31

5,308,440 5/1994 Chino et al. 156/664

5,324,683 6/1994 Fitch et al. 437/65

5,324,684 6/1994 Kermani et al. 437/95

5,334,356 8/1994 Baldwin et al. 422/133

5,336,914 8/1994 Andoh 257/368 --.

On the face page, in field (56), under "U.S. Patent Documents", in column 1, line 17, below "5,348,811 A 9/1994 Nagao et al." insert

-- 5,354,712 10/1994 Ho et al. 437/195

5,356,672 10/1994 Schmitt III et al. 427/446 --.

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## UNITED STATES PATENT AND TRADEMARK OFFICE CERTIFICATE OF CORRECTION

PATENT NO : 7,211,512

Page (4) of 20

DATED : May 1, 2007

INVENTOR(S) : Ahn et al.

It is certified that errors appear in the above-identified patent and that said Letters Patent  
is hereby corrected as shown below:

On the face page, in field (56), under "U.S. Patent Documents", in column 2, line 1, above  
"5,413,687 A 5/1995 Barton et al. 204/192.14" insert

-- 5,374,849 12/1994 Tada

5,384,284 1/1995 Doan et al. 437/190

5,399,897 3/1995 Cunningham et al. 257/467

5,401,680 3/1995 Abt et al.

5,408,742 4/1995 Zaidel et al. 29/846 --.

On the face page, in field (56), under "U.S. Patent Documents", in column 2, line 2, below  
"5,413,687 A 5/1995 Barton et al. 204/192.14" insert

-- 5,413,962 5/1995 Lur et al. 437/195

5,424,030 6/1995 Takahashi 420/473

5,426,330 6/1995 Joshi et al. 257/752

5,442,237 8/1995 Hughes et al. 257/759

5,444,015 8/1995 Aitken et al. 437/182 --.

On the face page, in field (74), in "Attorney, Agent, or Firm", in column 2, line 1, delete  
"Lunberg" and insert -- Lundberg --, therefor.

On page 2, in field (56), under "U.S. Patent Documents", in column 1, line 2, below  
"5,447,887 A 9/1995 Filipiak et al. 437/200" insert

-- 5,457,344 10/1995 Bartelink 257/737

5,470,789 11/1995 Misawa 437/190

5,470,801 11/1995 Kapoor et al. 437/238

5,476,817 12/1995 Numata 437/195

5,485,037 1/1996 Marrs. 257/712

5,495,667 \* 5/1996 Earnworth et al. 29

5,506,449 4/1996 Nakano et al. 257/758

5,510,645 4/1996 Fitch et al. 257/522

5,529,956 6/1996 Morishita 437/195

5,534,731 7/1996 Cheung 257/759

5,538,922 7/1996 Cooper et al. 437/195

5,539,060 7/1996 Tsunogae et al. 525/338

5,539,227 7/1996 Nakano 257/276 --.

MAILING ADDRESS OF SENDER:

PATENT NO. 7,211,512

SCHWEGMAN, LUNDBERG, WOESSNER, & KLUTH, P.A.  
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PATENT NO : 7,211,512

Page (5) of 20

DATED : May 1, 2007

INVENTOR(S) : Ahn et al.

It is certified that errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

On page 2, in field (56), under "U.S. Patent Documents", in column 1, line 3, below  
"5,572,072 A 11/1996 Lee" insert - -  
5,578,146 11/1996 Grant et al. 148/437 - -.

On page 2, in field (56), under "U.S. Patent Documents", in column 1, line 5, below  
"5,609,721 A 3/1997 Tsukune et al. 156/646.1" insert  
- - 5,625,232 4/1997 Numata et al. 257/758  
5,633,200 5/1997 Hu  
5,635,253 6/1997 Canaper 427/437 - -.

On page 2, in field (56), under "U.S. Patent Documents", in column 1, line 6, below  
"5,654,245 A 8/1997 Allen 438/629" insert  
- - 5,662,788 9/1997 Sandhu et al. 205/87  
5,667,600 9/1997 Gensing et al. 148/437 - -.

On page 2, in field (56), under "U.S. Patent Documents", in column 1, line 7, below  
"5,670,420 A 9/1997 Choi 437/189" insert  
- - 5,674,787 10/1997 Zhao et al. 437/230  
5,675,187 10/1997 Numata et al. 257/758  
5,679,608 10/1997 Cheung et al. 437/195  
5,681,441 10/1997 Svendsen et al. 205/114  
5,693,563 12/1997 Teong  
5,695,810 12/1997 Dubin et al. 427/96  
5,705,425 1/1998 Miura et al. 437/182 - -.

On page 2, in field (56), under "U.S. Patent Documents", in column 1, line 8, below  
"5,719,089 A 2/1998 Cherng et al. 438/637" insert  
- - 5,719,410 2/1998 Suehiro et al. 257/77  
5,719,447 2/1998 Gardner  
5,725,689 3/1998 Nishida et al. 148/320  
5,739,579 4/1998 Chiang et al. 257/635 - -.

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PATENT NO. 7,211,512

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Page (6) of 20

DATED : May 1, 2007

INVENTOR(S) : Ahn et al.

It is certified that errors appear in the above-identified patent and that said Letters Patent  
is hereby corrected as shown below:

On page 2, in field (56), under "U.S. Patent Documents", in column 1, line 9, below  
"5,763,953 A 6/1998 Iljima et al. 257/762" insert

-- 5,780,358	7/1998	Zhou	438/645
5,785,570	7/1998	Bruni	445/52
5,789,264	8/1998	Chung	
5,792,522	8/1998	Jin et al.	427/575
5,792,706	8/1998	Michael et al.	438/626
5,801,098	9/1998	Fiordalice et al.	438/653
5,814,557	9/1998	Venkataraman et al.	438/622
5,821,168	10/1998	Jain	438/692 --.

On page 2, in field (56), under "U.S. Patent Documents", in column 1, line 10, below  
"5,824,599 A 10/1998 Schacham-Diamand et al. 438/678" insert

-- 5,840,625	11/1998	Feldner	
5,852,871	12/1998	Khandros	29/843
5,858,877	1/1999	Dennison et al.	438/700
5,880,018	03/1999	Boeck	438/619 --.

On page 2, in field (56), under "U.S. Patent Documents", in column 1, line 11, below  
"5,891,797 A 4/1999 Farrar 438/619" insert

-- 5,880,018	4/1999	Havemann et al.	438/674
5,893,752	4/1999	Zhang et al.	438/687 --.

On page 2, in field (56), under "U.S. Patent Documents", in column 1, line 12, below  
"5,895,740 A 4/1999 Chien et al. 430/313" insert

-- 5,897,370	4/1999	Joshi et al.	438/632
5,899,740	5/1999	Kwon	
5,900,668	5/1999	Wollesen	257/522 --.

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SCHWEGMAN, LUNDBERG, WOESSNER, & KLUTH, P.A.  
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Atty Docket No: 303.672US1

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PATENT NO : 7,211,512

Page (7) of 20

DATED : May 1, 2007

INVENTOR(S) : Ahn et al.

It is certified that errors appear in the above-identified patent and that said Letters Patent  
is hereby corrected as shown below:

On page 2, in field (56), under "U.S. Patent Documents", in column 1, line 13, below  
 "5,907,772 A 5/1999 Iwasaki 438/253" insert  
 -- 5,911,113 6/1999 Yao et al. 438/649  
 5,913,147 6/1999 Dubin et al. 438/687  
 5,925,930 7/1999 Farnworth et al. 257/737  
 5,930,596 7/1999 Klose et al. 438/98  
 5,930,669 7/1999 Uzoh 438/627  
 5,932,928 8/1999 Clampitt 257/758  
 5,933,758 8/1999 Jain 438/687  
 5,937,320 A \* 8/1999 Andricacos et al. 438/614  
 5,940,733 8/1999 Beinglass et al. 438/655 --.

On page 2, in field (56), under "U.S. Patent Documents", in column 1, line 15, below  
 "5,962,923 A 10/1999 Xu et al. 257/774" insert  
 -- 5,968,327 10/1999 Kobayashi et al.  
 5,968,333 10/1999 Nogami et al. 205/184  
 5,969,422 10/1999 Ting et al. 257/762 --.

On page 2, in field (56), under "U.S. Patent Documents", in column 1, line 16, below  
 "5,972,179 A 10/1999 Chittipeddi et al. 204/192.17" insert  
 -- 5,972,804 10/1999 Tobin et al. 438/786  
 5,976,710 11/1999 Sachdev et al. 428/620  
 5,981,350 11/1999 Geusic et al. 438/386  
 5,985,759 11/1999 Kim et al. 438/653 --.

On page 2, in field (56), under "U.S. Patent Documents", in column 1, line 17, below  
 "5,989,623 A 11/1999 Chen et al. 427/97" insert  
 -- 5,994,776 11/1999 Fang et al. 257/758 --.

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Page (8) of 20

DATED : May 1, 2007

INVENTOR(S) : Ahn et al.

It is certified that errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

On page 2, in field (56), under "U.S. Patent Documents", in column 1, line 18, below  
"6,001,736 A 12/1999 Kondo et al." insert

-- 6,004,884 12/1999 Abraham 438/714

6,008,117 12/1999 Hong et al. 438/629 --.

On page 2, in field (56), under "U.S. Patent Documents", in column 1, line 19, below  
"6,015,465 A 1/2000 Kholodenko et al. 118/719" insert

-- 6,015,738 1/2000 Levy et al. 438/275 --.

On page 2, in field (56), under "U.S. Patent Documents", in column 1, line 20, below  
"6,017,820 A 1/2000 Ting et al." insert

-- 6,022,802 2/2000 Jang 438/656

6,028,362 2/2000 Omura

6,025,261 2//2000 Farrar et al. 438/619

6,030,877 2/2000 Lee et al. 438/381

6,030,895 2/2000 Joshi et al.

6,037,248 3/2000 Ahn 438/619

6,054,172 4/2000 Robinson et al. 427/97

6,057,226 5//2000 Wong 438/623

6,065,424 5/2000 Shachem-Diamand et al. 118/696

6,069,068 5/2000 Rathore et al. 438/628 --.

On page 2, in field (56), under "U.S. Patent Documents", in column 1, line 21, below  
"6,071,810 A 6/2000 Wada et al. 438/635" insert

-- 6,075,278 6/2000 Farrar 257/522

6,075,287 6/2000 Ingraham et al.

6,091,136 7/2000 Jiang et al. 257/676

6,091,475 7/2000 Ogino et al. 349/149

6,100,193 8/2000 Suehiro et al. 438/685

6,103,320 8/2000 Matsumoto et al.

6,120,641 10/2000 Stevens et al. 456/345.22

6,121,126 9/2000 Ahn et al. 438/602

6,126,989 10/2000 Robinson et al. 427/97 --.

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Page (9) of 20

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INVENTOR(S) : Ahn et al.

It is certified that errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

On page 2, in field (56), under "U.S. Patent Documents", in column 1, line 25, below  
 "6,140,234 A 10/2000 Uzoh et al." insert  
 -- 6,140,456 10/2000 Lee et al. 528/196  
 6,143,641 11/2000 Kitch 438/618  
 6,143,655 11/2000 Forbes et al. --.

On page 2, in field (56), under "U.S. Patent Documents", in column 1, line 26, below  
 "6,143,646 A 11/2000 Wetzel et al. 438/637" insert  
 -- 6,143,671 11/2000 Sugai  
 6,150,214 11/2000 Kaeriyama  
 6,150,261 11/2000 Hsu et al. 438/640 --.

On page 2, in field (56), under "U.S. Patent Documents", in column 1, line 28, below  
 "6,153,507 A 11/2000 Mikagi et al. 438/618" insert  
 -- 6,159,769 12/2000 Farnworth et al. 438/108  
 6,159,842 12/2000 Chang et al. 438/622  
 6,169,024 1/2001 Hussein --.

On page 2, in field (56), under "U.S. Patent Documents", in column 1, line 29, below  
 "6,171,661 B1 1/2000 Zheng et al. 427/535" insert  
 -- 6,174,804 1/2001 Hsu --.

On page 2, in field (56), under "U.S. Patent Documents", in column 1, line 31, below  
 "6,183,564 B1 2/2001 Reynolds et al. 118/719" insert  
 -- 6,187,656 2/2001 Lu et al. 438/592 --.

On page 2, in field (56), under "U.S. Patent Documents", in column 1, line 33, below  
 "6,197,688 B1 3/2001 Simpson 4380/678" insert  
 -- 6,197,181 \* 3/2001 Chen 205/123  
 6,204,065 3/2001 Ochiai 436/66 --.

MAILING ADDRESS OF SENDER:

SCHWEGMAN, LUNDBERG, WOESSNER, & KLUTH, P.A.  
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Atty Docket No: 303.672US1

PATENT NO. 7,211,512

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## UNITED STATES PATENT AND TRADEMARK OFFICE CERTIFICATE OF CORRECTION

PATENT NO : 7,211,512

Page (10) of 20

DATED : May 1, 2007

INVENTOR(S) : Ahn et al.

It is certified that errors appear in the above-identified patent and that said Letters Patent  
is hereby corrected as shown below:

On page 2, in field (56), under "U.S. Patent Documents", in column 1, line 34, below  
"6,207,222 B1 3/2001 Chen et al. 427/678" insert  
-- 6,207,553 5/2001 Buynoski et al. 438/622  
6,207,558 3/2001 Singhbi et al. 438/648  
6,208,016 3/2001 Farrar 257/643 --.

On page 2, in field (56), under "U.S. Patent Documents", in column 1, line 35, below  
"6,211,073 B1 4/2001 Ahn et al. 438/653" insert  
-- 6,211,049 4/2001 Farrar 438/597  
6,211,561 4/2001 Zhao 257/522  
6,214,719 4/2001 Nag 438/619  
6,215,186 4/2001 Konecni et al.  
6,218,282 4/2001 Buynoski 438/619  
6,221,763 4/2001 Gilton 438/643 --.

On page 2, in field (56), under "U.S. Patent Documents", in column 1, line 36, below  
"6,232,219 B1 5/2001 Blalock et al. 438/637" insert  
-- 6,245,658 6/2001 Buynoski 438/619  
6,245,662 B1 \* 6/2001 Naik et al. 438/622  
6,246,118 6/2001 Buynoski 257/758 --.

On page 2, in field (56), under "U.S. Patent Documents", in column 1, line 38, below  
"6,251,781 B1 6/2001 Zhou et al. 438/637" insert  
-- 6,258,707 7/2001 Uzoh --.

On page 2, in field (56), under "U.S. Patent Documents", in column 1, line 39, below  
"6,265,311 B1 7/2001 Hautala et al. 438/680" insert  
-- 6,265,811 7/2001 Takeuchi et al.  
6,268,276 7/2001 Chan et al. 438/619  
6,268,277 7/2001 Bang 438/619 --.

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## UNITED STATES PATENT AND TRADEMARK OFFICE CERTIFICATE OF CORRECTION

PATENT NO : 7,211,512

Page (11) of 20

DATED : May 1, 2007

INVENTOR(S) : Ahn et al.

It is certified that errors appear in the above-identified patent and that said Letters Patent  
is hereby corrected as shown below:

On page 2, in field (56), under "U.S. Patent Documents", in column 1, line 40, below

"6,271,592 B1	8/2001	Kim et al.	257/751" insert
-- 6,277,263	8/2001	Chen	205/182
6,281,585	8/2001	Bothra	257/758
6,284,656	9/2001	Farrar	438/687
6,287,954	9/2001	Ashley	438/622
6,288,442	9/2001	Farrar	257/678
6,288,447	9/2001	Amishiro et al.	
6,288,905	9/2001	Chung	361/771
6,290,833	9/2001	Chen	205/182 - -

On page 2, in field (56), under "U.S. Patent Documents", in column 1, line 42, below

"6,303,505 B1	10/2001	Ngo et al."	insert
-- 6,323,543	11/2001	Jiang et al.	257/676
6,323,553	11/2001	Hsu et al.	257/751
6,326,303	12/2001	Robinson et al.	38/678
6,329,279	12/2001	Lee	438/619
6,342,448	1/2002	Lin et al.	438/687
6,358,842	3/2002	Zhou et al.	438/633
6,358,849	3/2002	Havemann et al.	438/689
6,359,328	3/002	Dunbin	257/62 - -

On page 2, in field (56), under "U.S. Patent Documents", in column 1, line 43, below

"6,365,511 B1	4/2002	Kizilyalli et al."	insert
-- 6,368,954	4/2002	Lopatin et al.	438/622
6,368,966	4/2002	Krishnamoorthy	438/687 - -

On page 2, in field (56), under "U.S. Patent Documents", in column 1, line 44, below

"6,372,622 B1 *	4/2002	Tan et al."	insert
-- 6,376,370	4/2002	Farrar	438/678
6,383,920	5/2002	Wang et al.	438/639 - -

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## UNITED STATES PATENT AND TRADEMARK OFFICE CERTIFICATE OF CORRECTION

PATENT NO : 7,211,512

Page (12) of 20

DATED : May 1, 2007

INVENTOR(S) : Ahn et al.

It is certified that errors appear in the above-identified patent and that said Letters Patent  
is hereby corrected as shown below:

On page 2, in field (56), under "U.S. Patent Documents", in column 1, line 45, below  
"6,387,542 B1 \* 5/2002 Kozlov et al." insert  
-- 6,399,489 6/2002 M'Saad et al. 438/680 --.

On page 2, in field (56), under "U.S. Patent Documents", in column 1, line 46, below  
"6,403,481 B1 \* 6/2002 Matsuda et al." insert  
-- 6,403,481 6/2002 Matsuda et al. 438/687

6,417,094	7/2002	Zhao et al.	
6,428,673	8/2002	Ritzdorf et al.	205/84
6,429,120	8/2002	Ahn et al.	438/635
6,486,533	11/2002	Krishnamoorthy et al.	257/586
6,492,266	12/2002	Ngo et al.	
6,508,920	1/2003	Ritzdorf et al.	204/194
6,518,198	2/2003	Klein	438/758
6,552,432	4/2003	Farrar	257/751
6,563,219	5/2003	Ireland et al.	257/758
6,565,729	5/2003	Chen et al.	205/82
6,589,863	7/2003	Usami	
6,614,099	9/2003	Farrar	257/643
6,632,345	10/2003	Chen	205/182
6,638,410	10/2003	Chen et al.	205/182
6,664,197	12/2003	Stevens et al.	438/754
6,743,716	6/2004	Farrar	438/652
6,756,298	6/2004	Ahn et al.	438/635
2001/0002333	5/2001	Huang et al.	438/637
2001/0054771	12/2001	Wark et al.	257/786
2002/0014646	2/2002	Tsu et al.	257/296
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2002/0096768	7/2002	Joshi	257/750
2002/0109233	8/2002	Farrar	257/762
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2003/0034560 A1	2/2003	Matsuse et al.	
2004/0206308 A1	10/2004	Ahn et al.	
2005/0023697 A1	2/2005	Ahn et al.	--.

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## UNITED STATES PATENT AND TRADEMARK OFFICE CERTIFICATE OF CORRECTION

PATENT NO : 7,211,512

Page (13) of 20

DATED : May 1, 2007

INVENTOR(S) : Ahn et al.

It is certified that errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

On page 3, in field (56), under "Other Publications", in column 1, line 37, delete "electrless" and insert - - electroless - -, therefor.

On page 3, in field (56), under "Other Publications", in column 1, line 37, delete "SiO2" and insert - - SiO<sub>2</sub> - -, therefor.

On page 3, in field (56), under "Other Publications", in column 1, line 43, delete "on" and insert - - of - -, therefor.

On page 3, in field (56), under "Other Publications", in column 2, line 22, delete "mangetron" and insert - - magnetron - -, therefor.

On page 3, in field (56), under "Other Publications", in column 2, line 52, delete "SiO2" and insert - - SiO<sub>2</sub> - -, therefor.

On page 3, in field (56), under "Other Publications", in column 2, line 64, below "Thin Solid Films, 318, pp. 234-238, (1998)." insert  
- - Abe, K. , et al., "Sub-half Micron Copper Interconnects Using Reflow of Sputtered Copper Films", VLSI Multilevel Interconnection Conference, (June 25-27, 1995),308-311.

AMERICAN SOCIETY FOR METALS Metals Handbook, 8th Edition. Vol. 8, Metals Park, Ohio,(1973),300-302.

AMERICAN SOCIETY FOR METALS, Metals Handbook, Ninth Edition. Vol. 2, Properties and Selection: Nonferrous Alloys and Pure Metals, ASM Handbook Committee, (eds.), American Society for Metals, Metals Park, OH,(1989),157, 395.AMERICAN SOCIETY FOR METALS, "Phase Diagrams", Metals Handbook, 10th Ed. Vol. 3, Metals Park, Ohio,(1992).

Anonymo, "Formation of Conductors at Variable Depths – Using Differential Photomask, Projecting Images into Insulator by Reactive Ion Etching, Selectively Filling Images with Conductor", Research Disclosure, Disclosure No. RD 291015, Abstract,(July 10, 1988),1 page.

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## UNITED STATES PATENT AND TRADEMARK OFFICE CERTIFICATE OF CORRECTION

PATENT NO : 7,211,512

Page (14) of 20

DATED : May 1, 2007

INVENTOR(S) : Ahn et al.

It is certified that errors appear in the above-identified patent and that said Letters Patent  
is hereby corrected as shown below:

Chang, J. Y. C. , et al., "Large Suspended Inductors on Silicon and their use in a 2-urn  
CMOS RF Amplifier", IEEE Electron Device Letters. 14(5), (May 1993),246-248.

Craig, J. D., "Polyimide Coatings", Packaging. Electronic Materials Handbook, Vol. 1. ASM  
International Handbook Committee (eds.), ASM International, Materials Park, OH,(1989),767-  
772.

DOW COMPANY, "SILK' D Semiconductor Dielectric Resin", <http://www.dow.com/silk/odf/618-00317.pdf>, (Unknown),2 pages.

DOW COMPANY, "SILK' J Semiconductor Dielectric Resin", <http://www.dow.com/silk/a/df/618-00316.4df> (unknown),2 pages.

Dudzinski, N., et al., "The Youngs Modulus of Some Aluminim Alloys", J. Institute of Metals,  
Vol. LXXIV, (1947-48),291-314.

Ernst, et al., "Growth Model for Metal Films on Oxide Surface: Cu on ZnO(0001)-O", Physica  
Review B, 47, (May 15, 1993),13782-13796.

Fleming, J. G., et al., "Use Of Air Gap Structures To Lower Level Intralevel Capacitance",  
Proceedings of the 1997 Dielectrics for ULSI Multi-level Interconnect Conference, (1997),140.

Grill, A. , et al., "Low dielectric constant films prepared by plasma-enhanced chemical vapor  
deposition from tetramethvisilane", Journal of Applied Physics, 85(6), (1999),3314-3318.

Hirao, S. , et al., "A Novel Copper Reflow Process Using Dual Wetting Layers", 1997  
Symposium on VLSI Technology, Digest of Technical Papers,(1997),57-58.

Izaki, M. , et al., "Characterization of Transparent Zinc Oxide Films Prepared by  
Electrochemical Reaction", Journal of the Electrochemical Society, 144. (June 1997),1949-  
1952.

Jayaraj, K. , et al., "Low Dielectric Constant Microcellular Foams", Proceedings from the  
Seventh Meeting of the DuPont Symposium on Polyimides in Microelectronics September 1996  
,474-501.

Jin, C. , et al., "Porous Xerogel Films as Ultra-low Permittivity Dielectrics for ULSI  
Interconnect Applications", Conference Proceedings ULSI XII -1997. Materials Research  
Society (1997),463-469.

Kang, H. K., et al., "Grain Structure and Electromigration Properties of CVD CU Metallization"  
Proceedings of the 10th International VLSI Multilevel Interconnection Conference June 8-9,  
1993 ,223-229.

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## UNITED STATES PATENT AND TRADEMARK OFFICE CERTIFICATE OF CORRECTION

PATENT NO : 7,211,512

Page (15) of 20

DATED : May 1, 2007

INVENTOR(S) : Ahn et al.

It is certified that errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Kirk, Raymond E., Kirk-Othmer Concise Encyclopedia of Chemical Technology, Grayson, M., (ed.), John Wiley & Sons, Inc., New York, NY, (1985), 433-435, 926-938.

Martin, Steven J., "The Invention and Development of a Low-Dielectric Constant Polymer for the Fabrication of Integrated Circuit Interconnect", Seminar - Department of Chemical Engineering - North Carolina State University, (April 9, 2001), 1 page.

MIN, J., "Metal-organic atomic-layer deposition of titanium-silicon-nitride films", Applied Physics Letters, 75(11), (1999), 1521-1523.

Miyake, T. et al., "Atomic Hydrogen Enhanced Reflow of Copper" Applied, Physics Letters. 70(10), (1997), 1239-1241.

Palleau, J., et al., "Refractory Metal Encapsulation in Copper Wiring", Advanced Metallization for Devices and Circuits-Science, Technology and Manufacturability, Materials Research Society Symposium Proceedings, 337, (April 1994), 225 - 231.

Park, C. W., et al., "Activation Energy for Electromigration in Cu Films", Applied Physics Letters, 59(2), (July 6, 1991), 175-177.

Quan, Y. C., et al., "Polymer-like Organic Thin Films Deposited by Plasma Enhanced Chemical Vapor Deposition Using the Para-xylene Precursor as Low Dielectric Constant Interlayer Dielectrics for Multilevel Metallization", Japanese Journal of Applied Physics. Vol. 38. Part 1, No. 3A 1999, 1356-1358.

Ramos, T., et al., "Nanoporous Silica for Dielectric Constant Less Than 2", Conference Proceedings ULSI XII - 1997 Materials Research Society, (1997), 455-461.

Rossnagel, S. M., "Magnetron Sputter Deposition of Interconnect Applications", Conference Proceedings, ULSI XI, (1996), 227-232.

Shacham-Diamand, Y., "100 nm Wide Copper Lines Made by Selective Electroless Deposition", Journal of Micromechanics and Microengineering. 1, (March 1991), 66-72.

Shieh, B., et al., "Air-Gap Formation During IMD Deposition to Lower Interconnect Capacitance", IEEE Electron Device Letters, 19(1), (1998), 16-18.

Singer, Ferdinand L., "Strength of Materials", Harper & Brothers. New York, (1951), 229-32.

Srivatsa, A. R., et al., "Jet Vapor Deposition: an Alternative to Electrodeposition", Surface Engineering. 11, (1995), 75-77.

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## UNITED STATES PATENT AND TRADEMARK OFFICE CERTIFICATE OF CORRECTION

PATENT NO : 7,211,512

Page (16) of 20

DATED : May 1, 2007

INVENTOR(S) : Ahn et al.

It is certified that errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Tao, J. , et al., "Electromigration Characteristics of Copper Interconnects", IEEE Electron Devices Letters, 14(5), (May 1993),249-251.

Ting, C. H., "Methods and Needs for Low K Material Research", Materials Research Society Symposium Proceedings. Volume 381, Low-Dielectric Constant Materials -- Synthesis and Applications in Microelectronics, Lu, T.M., et al., (eds.), San Francisco, CA,(April 17-19,1995) 3-17.

Uchida, Y. , et al., "A Fluorinated Organic-Silica Film with Extremely Low Dielectric Constant", Japanese Journal of Applied Physics. Vol. 38 Part1 No. 4B, (April 1999),2368-2372.

Ueda, T. , et al., "A novel Air Gap Integration Scheme for Multi-level Interconnects using Self-aligned Via Plugs" Symposium on VLSI Technology Digest of Technical Papers (1998), 46-47.

Wang, X. W., et al., "Highly Reliable Silicon Nitride Thin Films Made by Jet Vapor Deposition" Japanese Journal of Applied Physics. Vol. 34, Part No. 2B, (February 1995),955-958.

Wolf, S. , et al., Silicon Processing for the VLSI Era. Vol. 1 -- Process Technology, Lattice Press, Sunset Beach, CA,(1986),514-538.

Wolf, S. , "Chapter 4: Multilevel-Interconnect Technology for VLSI and ULSI", Silicon Processing for the VLSI Era, Vol. 2 Process Integration, Lattice Press, Sunset Beach, CA,(1990),176-297.

Zhang, F , et al., "Nanoglass/sup TM/ E copper damascene processing for etch, clean, and CMP", Proceedings of the IEEE 2001 International Interconnect Technology Conference, (2001),57-9.

AMERICAN SOCIETY FOR METALS, "Properties and Selection: Nonferrous Alloys and Pure Metals", Metals Handbook. 9th ed.. vol. 2, Metals Park, Ohio,(1979),Table of Contents.

Van Horn, K. R., "Aluminum Vol. III Fabrication and Finishing", American Society for Metals, Metals Park, OH,(1967),468.

Murarka, S. P., et al., Topper Metallization for ULSI and Beyond' Critical Reviews in Solid State and Materials Sciences 20 2 1995, 87-124.

Bai, G. , "Copper Interconnection Deposition Techniques and Integration", 1996 Symposium on VLSI Technoloav, Digest of Technical Papers, (1996), pp. 48-49.

Bhansali, S., et al., "Selective seeding of copper films on polyimide-patterned silicon substrate, using ion implantation", Sensors and Actuators A: Physical, 52 1 March 1996, 126-131. - - .

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## UNITED STATES PATENT AND TRADEMARK OFFICE CERTIFICATE OF CORRECTION

PATENT NO : 7,211,512

Page (17) of 20

DATED : May 1, 2007

INVENTOR(S) : Ahn et al.

It is certified that errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

In column 3, line 66, after "invention" delete "." and insert - - ; - -, therefor.

In column 4, line 22, delete "unhoped" and insert - - undoped - -, therefor.

In column 11, line 52, delete "copending" and insert - - co-pending - -, therefor.

In column 13, line 54, in Claim 1, before "seed" insert - - discontinuous - -.

In column 13, line 56, in Claim 1, after "on" delete "the substrate" and insert - - a semiconductor substrate, wherein individual elements of the discontinuous seed layer are substantially isolated from each other - -, therefor.

In column 13, line 63, in Claim 1, after "layer" insert - - and exposed portions of the seed layer - -.

In column 14, line 9, in Claim 5, before "seed" insert - - discontinuous - -.

In column 14, line 10, in Claim 5, delete "(Cu)having" and insert - - (Cu) having - -, therefor.

In column 14, line 10, in Claim 5, before "discontinuous" delete "a".

In column 14, lines 10-11, in Claim 5, delete "island structure on the" and insert - - islands on a semiconductor - -, therefor.

In column 14, line 12, in Claim 5, delete "technique;" and insert - - technique, wherein the discontinuous islands are substantially electrically isolated from each other; - -, therefor.

In column 14, line 16, in Claim 5, after "layer;" insert - - and - -.

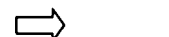
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## UNITED STATES PATENT AND TRADEMARK OFFICE CERTIFICATE OF CORRECTION

PATENT NO : 7,211,512

Page (18) of 20

DATED : May 1, 2007

INVENTOR(S) : Ahn et al.

It is certified that errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

In column 14, lines 20–21, in Claim 6, delete “having a discontinuous island structure includes a discontinuous island structure” and insert - - includes discontinuous islands - -, therefor.

In column 14, line 25, in Claim 7, delete “vias, wherein the number of copper vias form” and insert - - structures, wherein copper structures are formed - -, therefor.

In column 14, line 28, in Claim 8, delete “vias” and insert - - structures - -, therefor.

In column 14, line 35, in Claim 10, after “first” insert - - discontinuous - -.

In column 14, line 36, in Claim 10, delete “substrate;” and insert - - semiconductor substrate, wherein individual elements of the first discontinuous seed layer are substantially electrically isolated from each other; - -, therefor.

In column 14, line 40, in Claim 10, after “of” delete “or”.

In column 14, line 45, in Claim 10, after “second” insert - - discontinuous - -.

In column 14, line 46, in Claim 10, after “(Pd)” insert - - or - -.

In column 14, line 65, in Claim 13, after “first” delete “number of”.

In column 14, line 66, in Claim 13, delete “form” and insert - - are formed - -, therefor.

In column 15, line 14, in Claim 17, before “seed” insert - - discontinuous - -.

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## UNITED STATES PATENT AND TRADEMARK OFFICE CERTIFICATE OF CORRECTION

PATENT NO : 7,211,512

Page (19) of 20

DATED : May 1, 2007

INVENTOR(S) : Ahn et al.

It is certified that errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

In column 15, line 14, In Claim 17, delete "substrate" and insert - - semiconductor substrate, wherein individual elements of the first discontinuous seed layer are substantially electrically isolated from each other - -, therefor.

In column 15, line 19, in Claim 17, delete "plating;" and insert - - plating to a top surface of the first photoresist layer; - -, therefor.

In column 15, line 20, in Claim 17, after "second" insert - - discontinuous - -.

In column 15, line 28, in Claim 17, after "third" insert - - discontinuous - -.

In column 15, line 38, in Claim 18, after "fourth" insert - - discontinuous - -.

In column 16, line 3, in Claim 25, after "first" insert - - discontinuous - -.

In column 16, line 4, in Claim 25, before "substrate" insert - - semiconductor - -.

In column 16, line 5, in Claim 25, delete "process;" and insert - - process, wherein individual elements of the first discontinuous seed layer are substantially electrically isolated from each other; - -, therefor.

In column 16, line 11, in Claim 25, after "plating" insert - - to a top surface of the first photoresist layer - -.

In column 16, line 12, in Claim 25, after "second" insert - - discontinuous - -.

In column 16, line 19, in Claim 25, after "third" insert - - discontinuous - -.

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## UNITED STATES PATENT AND TRADEMARK OFFICE CERTIFICATE OF CORRECTION

PATENT NO : 7,211,512

Page (20) of 20

DATED : May 1, 2007

INVENTOR(S) : Ahn et al.

It is certified that errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

In column 16, line 50, in Claim 31, after "first" insert - - discontinuous - -.

In column 16, line 51, in Claim 31, delete "substrate;" and insert - - semiconductor substrate, wherein individual elements of the first discontinuous seed layer are substantially electrically isolated from each other; - -, therefor.

In column 16, line 57, in Claim 31, after "second" insert - - discontinuous - -.

In column 16, line 65, in Claim 31, after "third" insert - - discontinuous - -.

In column 17, line 3, in Claim 31, after "layer;" delete "and".

In column 17, line 6, in Claim 31, after "fourth" insert - - discontinuous - -.

In column 18, line 11, in Claim 37, delete "wherein the further includes" and insert - - further including - -, therefor.

In column 18, line 14, in Claim 37, after "and" insert - - on - -.

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